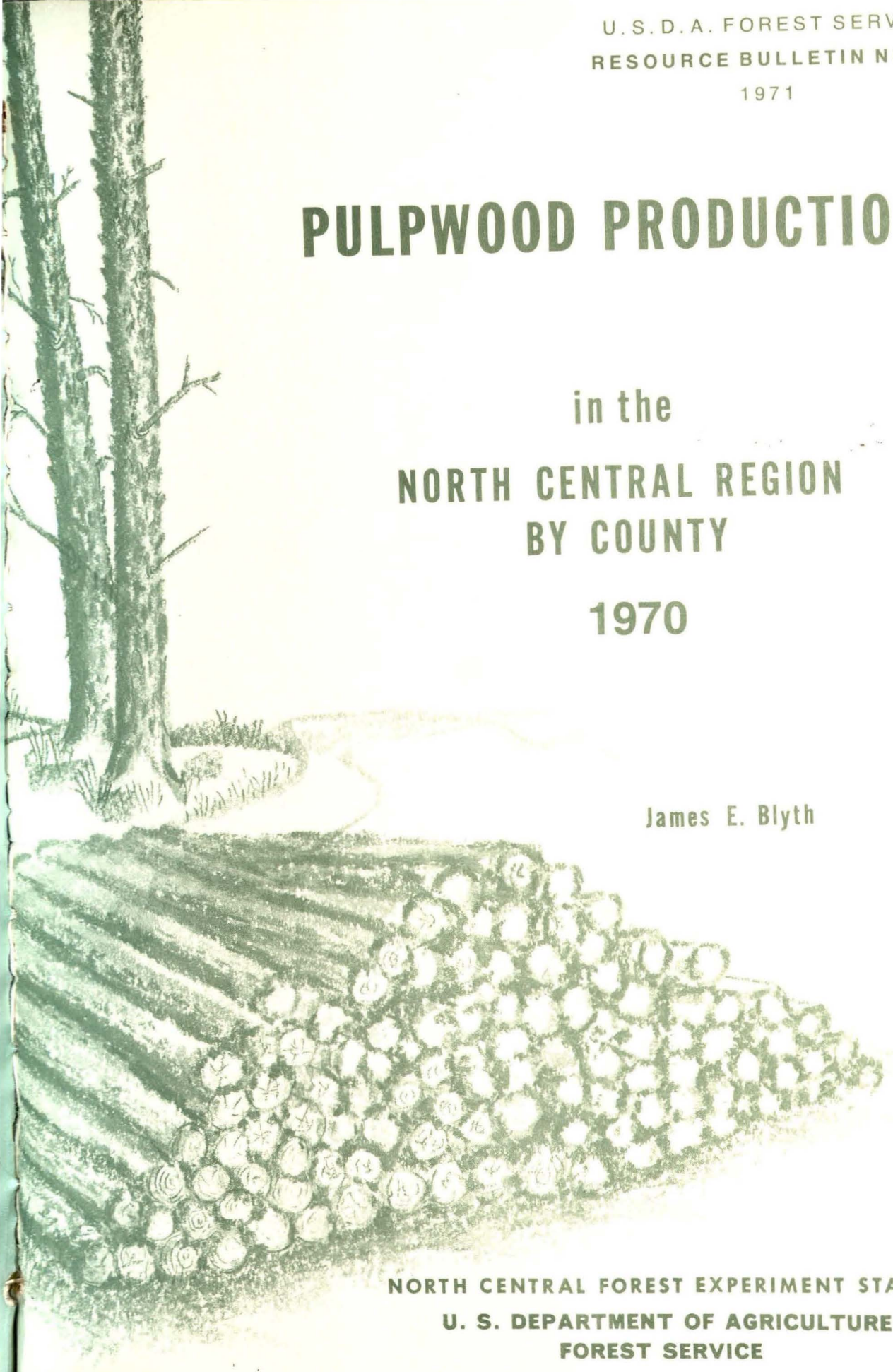
U.S.D.A. FOREST SERVICE
RESOURCE BULLETIN NC-13
1971

PULPWOOD PRODUCTION

in the

NORTH CENTRAL REGION BY COUNTY

1970



James E. Blyth

NORTH CENTRAL FOREST EXPERIMENT STATION
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Mr. Blyth is a Market Analyst for the Station and is headquartered at the main office in St. Paul, Minnesota.

North Central Forest Experiment Station
D. B. King, Director
Forest Service - U.S. Department of Agriculture
Folwell Avenue
St. Paul, Minnesota 55101

(Maintained in cooperation with the University of Minnesota)
Manuscript approved for publication September 30, 1971

PULPWOOD PRODUCTION IN THE NORTH CENTRAL REGION, BY COUNTY, 1970

James E. Blyth

This is the 12th annual report on the pulpwood harvest in Lake States counties and the 11th annual report on the Central States harvest. The Lake States (Michigan, Minnesota, and Wisconsin) and Central States (Illinois, Indiana, Iowa, and Missouri) are discussed separately because the timber types in each area are different and less information can be released about the Central States—more detailed data published on pulpwood production and receipts in the Central States would reveal the operations of individual mills.

Pulpmills using North Central States timber in 1970 reported their pulpwood receipts by State and county. Their cooperation is gratefully acknowledged. Thanks are also due to Ray Pfeifer, Staff Forester, Forest Resource Development, Michigan Department of Natural Resources, for collecting data on the Michigan pulpmills.

LAKE STATES

Although national production of paper and paperboard fell to 90 percent of capacity in 1970, Lake States pulpwood production rose moderately to a record high. Some pulpwood inventory buildup probably occurred during 1970.

Production Up 9 Percent

Lake States pulpwood production[1] nudged past the 1966 record to a new high of 4,287,000 cords in 1970, nearly 350,000 cords more than in 1969 (fig. 1). All but 1 percent was consumed in the Lake States. Ninety-two percent was roundwood; the remainder was residue[2] from local wood-using plants. Roundwood output rose 8 percent while Lake States residue used for pulping climbed 21 percent. Since 1964, hardwood residue sold by Lake States firms to pulpmills has increased an average of 18 percent annually (fig. 2). Seven out of eight cords of Lake States residue delivered to pulpmills were in chip form.

Harvests of all reported species increased. Pine, birch, and miscellaneous hardwoods production each advanced more than 50,000 cords. Technological advances in pulping birch spurred the use of this species since 1967. This trend is important because large volumes of paper birch are available in the Lake States and prospects are poor for increasing markets for other products.

One-fifth of the roundwood was peeled before delivery. Two-fifths of the aspen was peeled and constituted most of the peeled wood. Loggers peeled 59 percent of the aspen cut in Wisconsin, 39 percent in Michigan, and 16 percent in Minnesota (fig. 3).

1970 Pulpwood Production by State

Of the 1970 Lake States pulpwood cut, Wisconsin provided 39 percent, Michigan 33 percent, and Minnesota 28 percent.

The distribution of the pulpwood harvest is shown in two ways: first, the amount of pulpwood cut relative to commercial forest area, and second, the amount of pulpwood cut relative to the merchantable volume in major pulpwood species.

---

[1] *Pulpwood production is defined as the pulpwood volume from timber lands in a specified area that was received at all mills during 1970, whereas pulpwood receipts are defined as the volume of wood received by mills in a specified area regardlesss of the geographic source.*

[2] *Residue is the byproduct from sawmills, veneer mills, cooperage mills, and other wood-using plants that is used for pulping. Residue includes slabs, edgings, veneer cores, sawdust, wood flour, and chips manufactured from these byproducts.*

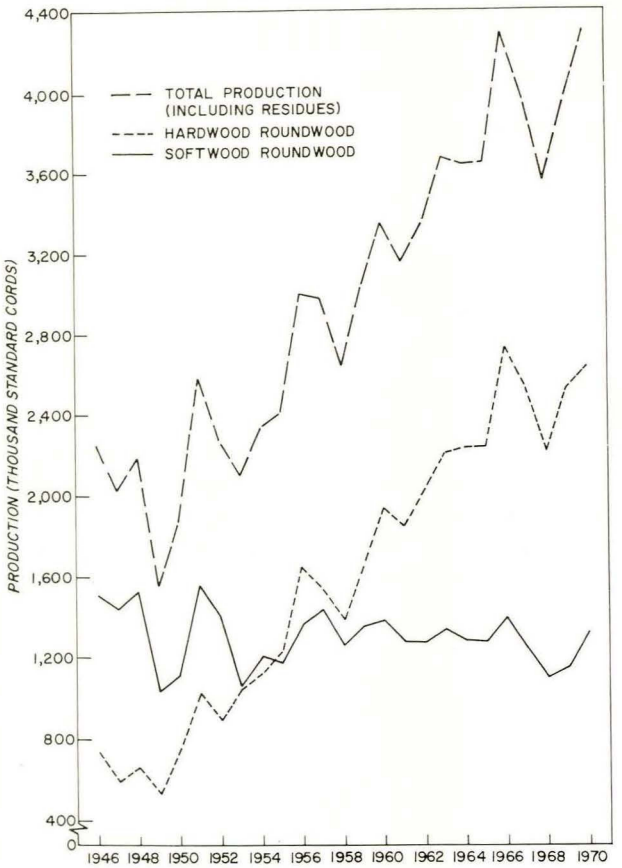


Figure 1.—Pulpwood production in the Lake States, 1946–1970.

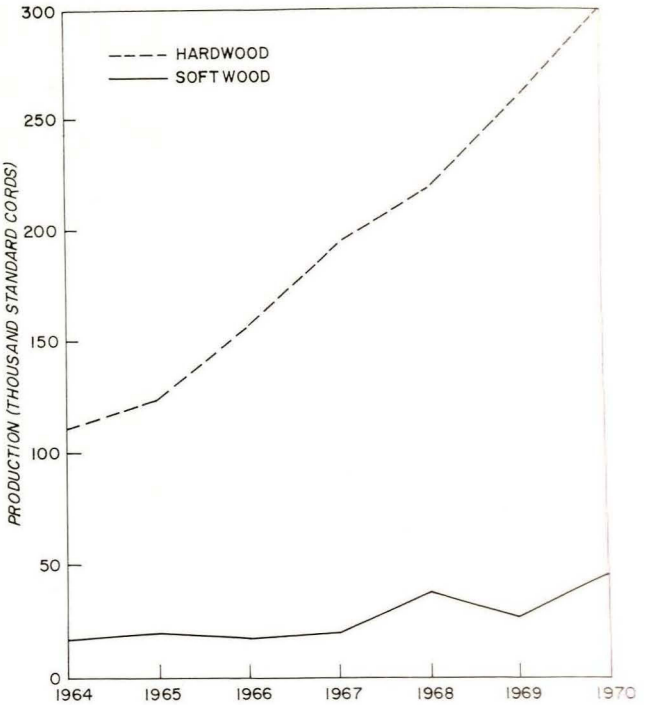


Figure 2.—Pulpwood production from Lake States residue, 1964–1970.

More than 100 cords of pulpwood were cut per 1,000 acres of stocked commercial forest land in 3 Minnesota, 18 Wisconsin, and 18 Michigan counties (fig. 4). The rate of cutting per 1,000 cords of merchantable volume in principal pulpwood species was greatest in northeast Wisconsin and lowest in southern Wisconsin (fig. 5).

Wisconsin production 8 percent above previous peak.—All reported species groups contributed to the 213,000-cord roundwood harvest increase above 1969. Harvest gains were largest for aspen, miscellaneous hardwoods, and pine. Hardwood plant residue volume, supplied by Wisconsin sources for pulping, slipped moderately. Oneida, Marinette, and Lincoln County loggers cut the largest pulpwood volume. Production spurted 20,000 cords or more in Langlade, Marinette, Vilas, and Iron Counties.

Michigan output climbs more than 100,000 cords.—Major harvest increases were in pine and balsam

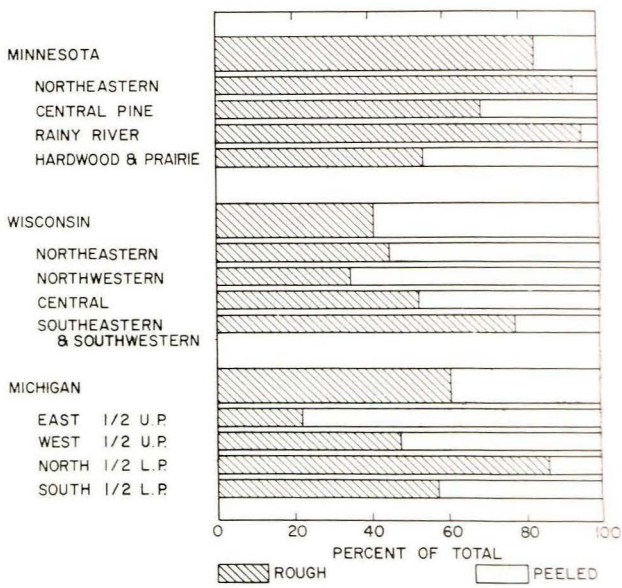


Figure 3.—Percent of rough and peeled aspen production of roundwood, by State and Forest Survey Unit, 1970.

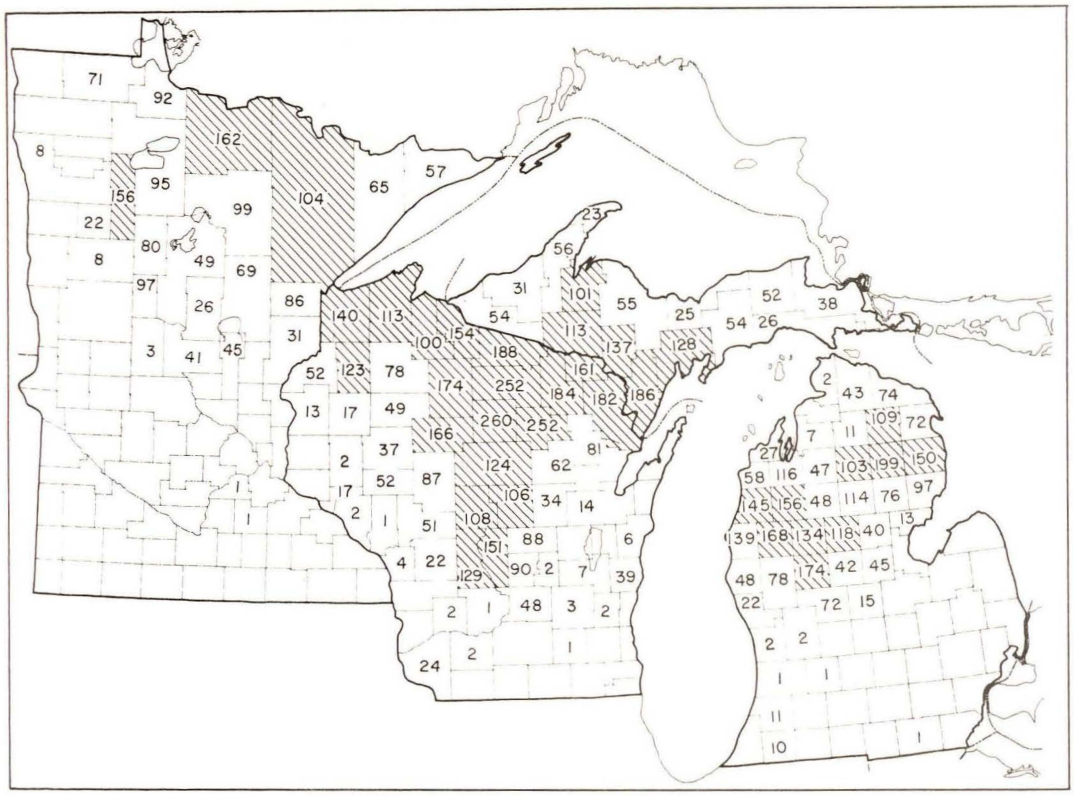


Figure 4.—Cords of pulpwood cut per 1,000 acres of stocked commercial forest land in principal pulpwood-producing counties, 1970. Crosshatching shows counties that supplied 100 or more cords of pulpwood per 1,000 acres of stocked commercial forest land.

fir. However, 3.6 cords of pine were cut for every cord of balsam fir. Most of the additional cut came from the eastern Upper Peninsula and the northern Lower Peninsula. Top-producing counties were Menominee, Delta, and Iron.

Minnesota production inches above 1967 all-time high.—Minnesota wood-using plants supplied 38,000 more cords of residue to pulpmills than in 1969. Roundwood harvesting was steady. Aspen production fell 60,000 cords but was offset by increases in birch and spruce. Three large counties—St. Louis, Koochiching, and Itasca—furnished 57 percent of the harvest.

Receipts Spurt 317,000 Cords

Forty-four Lake States plants received 4.7 million cords of pulpwood in 1970, more than in any year except 1966. Of those plants, 41 use aspen, 23 use spruce, and 19 use balsam fir (table 1). Nearly nine out of 10 cords received were roundwood or chips from roundwood.

Pine, birch, miscellaneous hardwoods, softwood residue, and hardwood residue receipts at regional mills were larger than ever before. Since 1964, softwood residue receipts have more than doubled and hardwood residue receipts have tripled.

Table 1.—*Number of plants using the different species of wood for pulping in 1970*

Species and kind of material	Lake States	Minn.	Wis.	Mich.
Aspen	41	9	24	8
Balsam fir	19	5	9	5
Birch	8	1	5	2
Hemlock	7	--	6	1
Pine	11	3	5	3
Spruce	23	5	13	5
Tamarack	4	--	4	--
Misc. hardwoods	16	2	9	5
Wood chips	12	2	6	4
Slabwood and other residue	6	--	4	2
Total plants	44	9	26	9

Net imports from other States and Canada approached 400 thousand cords (table 2). Other States supplied nearly 3 out of 5 imported cords; Canada shipped the remainder.

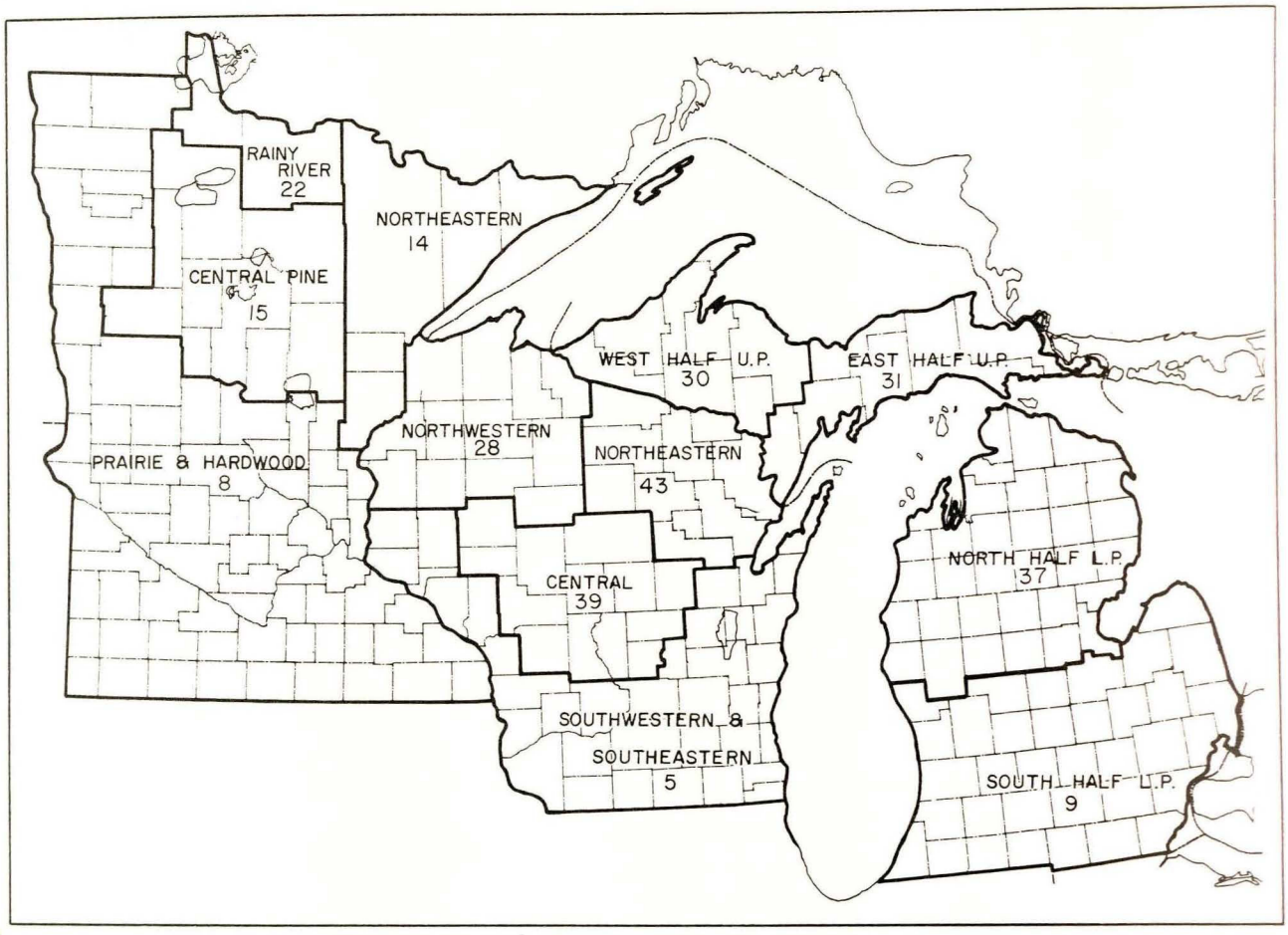


Figure 5.—Cords of pulpwood bolts and logs harvested per 1,000 cords of merchantable volume in principal pulpwood species, by Forest Survey Unit, 1970. The heavy lines delineate the boundaries of the Forest Survey Units in each State.

Table 2.—*Pulpwood exports and imports for the Lake States, 1970*
(Thousand standard cords, unpeeled)

Species	Exports	Imports	Net exports or (imports)
Aspen	2	12	(10)
Birch	1	--	1
Balsam fir	*	--	*
Pine	1	119	(118)
Spruce	20	113	(93)
Mixed hardwoods	6	7	(1)
Residues, softwood	4	179	(175)
Residues, hardwood	11	12	(1)
Total	45	442	(397)

*Less than 500 cords.

Three-fourths of the softwood residue receipts at Lake States pulpmills came as chips from five western States—Colorado, Idaho, Montana, South Dakota, and Wyoming. These five States plus Nebraska provided 10 percent of the pine roundwood receipts. Spruce and pine are the primary imports from Canada.

Minnesota mills bought record volumes of birch roundwood, softwood residue, and hardwood residue. Birch purchases never before above 5,000 cords, jumped to 31,000 cords. Minnesota forests provided 93 percent of the State's pulpwood requirements.

Pulpwood procurement in Wisconsin exceeded all previous years. Demand for pine, birch, miscellaneous hardwoods, and hardwood residue reached new highs. Wisconsin received more than half of the Canadian wood and all of the wood imported from the western States, except a small quantity of spruce.

Pulpwood demand in Michigan remained steady for the fourth straight year. Pine purchases rose 31 percent and aspen purchases fell 7 percent. Softwood residue

was received for pulping in Michigan for the first time in 1970.

Rising Regional Mill Capacity and Declining Number of Plants Expected

Regional pulpmill capacity is about 10,000 tons per day (table 3). During the next 2 or 3 years, pulping capacity is likely to expand, especially in the sulfate (kraft) process. At the same time, several small plants may close resulting in a net loss in the number of active plants. Two small Wisconsin pulpmills closed during 1970. Several other small operations have indicated they may close in the next year or two.

CENTRAL STATES

For the third consecutive year, Central States pulpwood production climbed. Rising pulpwood exports to new and expanding mills in surrounding States is the major reason for the production increase. Roundwood production is shifting from soft hardwoods[3] to hard hardwoods.

Production Over 400,000 Cords for First Time

Central States pulpwood production reached 406,000 cords in 1970, an 8 percent gain over 1969 (table 4). Most of the increase was in hard hardwood roundwood (including chips from roundwood). During the last 8 years, hard hardwood pulpwood cutting has risen sporadically while the cutting of soft hardwoods has declined significantly as shown below (in thousand cords):

Year	*Soft Hardwoods*	*Hard Hardwoods*
1962	164	87
1963	143	78
1964	151	86
1965	133	67
1966	131	95
1967	105	78
1968	117	93
1969	98	88
1970	97	117

[3]*Soft hardwoods include species such as elm, basswood, soft maple, yellow-poplar, and cottonwood. Hard hardwoods include oak, hard maple, beech, and hickory.*

Use of hard hardwoods has increased because the fiber yield per unit of weight is greater than for soft hardwoods. In addition, loggers usually prefer to cut hard hardwoods when they are paid on a weight basis without a delivered price differential between hard and soft hardwoods.

Pulpwood output from plant residue held steady in 1970 and accounted for almost half the area's production. From 1965 to 1969, buying of Central States residue for pulping increased phenomenally for several reasons (fig. 6). Some sawmills installed debarkers and chippers to upgrade their residue to the quality needed by pulpmills. Some pulpmills had difficulty obtaining roundwood because woods labor was scarce, but found other primary wood-using mills to be reliable suppliers of wood chips from their plant byproducts. Finally, less woodyard space is required at pulpmills when chips from byproducts are substituted for roundwood.

Pulping of Central States residue will probably continue to increase for the same reasons. In addition, new pollution control laws restricting burning of waste material may stimulate primary mills to locate pulpwood outlets for their byproducts.

Exports rose sharply to 87,000 cords, more than twice the 1969 level. New and expanding Kentucky mills received nearly three-fourths of this wood with the remainder shipped to Michigan, Minnesota, Mississippi, and Ohio. Export markets are important to Indiana and are becoming important to Missouri (table 5). These markets have not developed significantly for Illinois producers but are likely to do so within a few years. Most Iowa pulpwood markets will probably continue to be within the Central States. Several large modern pulpmills, adjacent to the Central States and purchasing wood from this area, are expected to boost their purchases. By contrast, export markets are relatively unimportant outlets for Lake States wood.

Each Central State, except Illinois, produced a record volume of pulpwood in 1970. Iowa production nearly doubled from 1969. Pulpwood output has increased four consecutive years in Missouri and three in Indiana.

During 1970, the Iowa roundwood harvest rose abruptly while changing only slightly in each of the other States.

The number of Central States counties supplying roundwood increased from 122 in 1969 to 145 in 1970. Forty-nine were in Indiana, 46 in Illinois, 31 in Missouri, and 19 in Iowa (fig. 7). Top-producing counties in each

Table 3.—*Active woodpulp mills in the Lake States, by location, type of pulp produced, and capacity, 1970*

Company	Location	Mill capacity in tons per 24 hours 1/				
		Total	Sulfite	Sulfate	Groundwood and other mechanical	Semi-chemical
Minnesota:						
Blandin Paper Co.	Grand Rapids	205	--	--	205	--
Hennepin Paper Co.	Little Falls	65	--	--	65	--
Boise Cascade Corp.	International Falls	850	--	300	550	--
Northwest Paper Co., The	Cloquet	425	120	305	--	--
Nu-Ply Corp.	Bemidji	75	--	--	75	--
St. Regis Paper Co.	Sartell	125	--	--	125	--
Superwood Corp.	Duluth	240	--	--	240	--
Hoerner Waldorf Corp.	St. Paul	300	--	--	--	300
Conwed Corp.	Cloquet	350	--	--	350	--
Total	9 plants	2,635	120	605	1,610	300
Wisconsin:						
American Can Co.	Green Bay	210	150	--	60	--
American Can Co.	Rothschild	190	190	--	--	--
Badger Paper Mills, Inc.	Peshtigo	90	90	--	--	--
Combined Paper Mills, Inc.	Combined Locks	175	--	--	175	--
Consolidated Papers, Inc.	Appleton	155	155	--	--	--
Consolidated Papers, Inc.	Stevens Point	100	--	--	100	--
Consolidated Papers, Inc.	Wisconsin Rapids	655	--	360	295	--
Green Bay Packaging, Inc.	Green Bay	200	--	--	--	200
Kansas City Star Co.	Park Falls	115	115	--	--	--
Kimberly-Clark Corp.	Kimberly	150	--	--	150	--
Kimberly-Clark Corp.	Niagara	150	--	--	150	--
Mosinee Paper Mills Co.	Mosinee	200	--	200	--	--
Nekoosa-Edwards Paper Co.	Nekoosa	310	--	310	--	--
Nekoosa-Edwards Paper Co.	Port Edwards	215	215	--	--	--
Owens-Illinois	Tomahawk	615	--	--	--	615
Charmin Paper Products Co.	Green Bay	2/	2/	--	2/	--
Scott Paper Co.	Marinette	50	50	--	--	--
Scott Paper Co.	Oconto Falls	110	110	--	--	--
St. Regis Paper Co.	Rhinelander	120	120	--	--	--
St. Regis Paper Co.	Cornell	50	--	--	50	--
Sterling Pulp & Paper Co. 3/	Eau Claire	60	--	--	60	--
Superior Fiber Products Co.	Superior	140	--	--	140	--
Thilmany Pulp & Paper Co.	Kaukauna	375	--	375	--	--
Tomahawk Pulp Co., Inc.	Tomahawk	50	--	--	50	--
Wausau Paper Mills Co.	Brokaw	145	145	--	--	--
Evans Products Co.	Phillips	80	--	--	80	--
Total	26 plants	4,710	1,340	1,245	1,310	815
Michigan:						
Abitibi Corp.	Alpena	430	--	--	430	--
Celotex Corp.	L'Anse	270	--	--	270	--
Hoerner Waldorf Corp.	Ontonagon	250	--	--	--	250
Manistique Pulp & Paper Co.	Manistique	90	--	--	90	--
Mead Corp., The	Groos	100	--	--	100	--
Menasha Corp.	Otsego	225	--	--	--	225
Packaging Corp. of America.	Filer City	600	--	200	--	400
Scott Paper Co.	Menominee	20	--	--	20	--
Warren Co., S.D.	Muskegon	225	--	225	--	--
Total	9 plants	2,210	--	425	910	875
All States	44 plants	9,555	1,460	2,275	3,830	1,990

1/ Lockwood's Directory of the Paper and Allied Industries-1970, and 1971 Directory of the Forest Products Industry.

2/ Capacity not available.

3/ Pulpmill closed permanently in July 1970.

Table 4.—*Central States pulpwood production and receipts, by State, 1970*

(In standard cords unpeeled)[1]

Species group and destination	Production[2]					Imports			Total receipts
	Illinois	Indiana	Iowa	Missouri	Region	Lake States	Other U. S.	Total imports	
Softwoods									
Illinois	1,200	--	--	--	1,200	--	--	--	1,200
Ind., Iowa, Mo.[3]	80	--	80	--	160	--	--	--	160
Exported[4]	--	9	--	301	310	--	--	--	--
Total	1,280	9	80	301	1,670	--	--	--	1,360
Soft hardwoods									
Illinois	29,192	1,302	1,111	311	31,916	1,332	444	1,776	33,692
Ind., Iowa, Mo.[3]	4,114	26,047	15,210	14,151	59,522	1,000	1,000	2,000	61,522
Exported[4]	265	4,018	--	1,291	5,574	--	--	--	--
Total	33,571	31,367	16,321	15,753	97,012	2,332	1,444	3,776	95,214
Hard hardwoods									
Illinois	22,965	3,927	--	120	27,012	--	--	--	27,012
Ind., Iowa, Mo.[3]	7,788	31,702	19,700	4,769	63,959	2,700	2,415	5,115	69,074
Exported[4]	955	19,881	--	4,825	25,661	--	--	--	--
Total	31,708	55,510	19,700	9,714	116,632	2,700	2,415	5,115	96,086
Total roundwood									
Illinois	53,357	5,229	1,111	431	60,128	1,332	444	1,776	61,904
Ind., Iowa, Mo.[3]	11,982	57,749	34,990	18,920	123,641	3,700	3,415	7,115	130,756
Exported[4]	1,220	23,908	--	6,417	31,545	--	--	--	--
Total	66,559	86,886	36,101	25,768	215,314	5,032	3,859	8,891	192,660
Residues softwood									
Illinois	968	--	10,227	--	11,195	2,287	6,091	8,378	19,573
Ind., Iowa, Mo.[3]	--	--	--	--	--	--	3,799	3,799	3,799
Exported[4]	433	--	--	626	1,059	--	--	--	--
Total	1,401	--	10,227	626	12,254	2,287	9,890	12,177	23,372
Residues hardwood									
Illinois	28,784	206	1,818	36,597	67,405	7,132	5,813	12,945	80,350
Ind., Iowa, Mo.[3]	14,615	31,334	8,581	1,485	56,015	3,727	5,324	9,051	65,066
Exported[4]	6,661	29,364	954	17,643	54,622	--	--	--	--
Total	50,060	60,904	11,353	55,725	178,042	10,859	11,137	21,996	145,416
All wood material									
Illinois	83,109	5,435	13,156	37,028	138,728	10,751	12,348	23,099	161,827
Ind., Iowa, Mo.[3]	26,597	89,083	43,571	20,405	179,656	7,427	12,538	19,965	199,621
Exported[4]	8,314	53,272	954	24,686	87,226	--	--	--	--
Total	118,020	147,790	57,681	82,119	405,610	18,178	24,886	43,064	361,448

1/ Factors used in converting to standard green cords (128 cu. ft.) were: 4,500 pounds of soft hardwood roundwood; 5,000 pounds of hard hardwood or coniferous roundwood; 4,100 pounds of softwood chips (green); 4,400 pounds of hardwood chips (green); 2,500 pounds of chips (all species, dry).

2/ Vertical columns of figures under box heading "Production" present the amount of pulpwood cut in each State.

3/ Combined to prevent disclosure of individual mill receipts.

4/ Pulpwood shipped to mills outside the region.

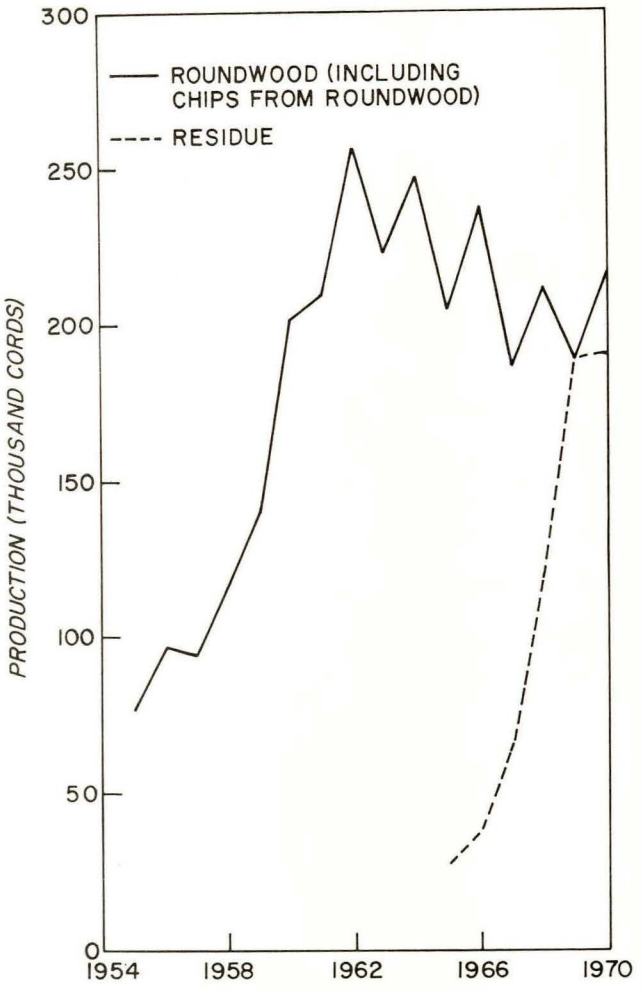


Figure 6.—Pulpwood production from Central States roundwood and residue, 1955–1970. (Data for residue not available before 1965, but was negligible.)

State were Jackson and Lawrence in Indiana, Alexander and Pulaski in Illinois, Mississippi and Clark in Missouri, and Dubuque and Louisa in Iowa.

Receipts Drop Nine Percent

Fifteen Central States plants received 361,000 cords in 1970, 34,000 cords below 1969. Roundwood purchases were stable while procurement of residue fell (table 6). Imports slipped to 12 percent of all wood receipts as compared with 15 percent in 1969.

Pulping capacity was about 1,500 tons per day at the end of 1970 (table 7). One Indiana pulpmill closed during the year. No major expansions were announced at the other mills.

Table 6.—*Trends in receipts (thousand standard cords, unpeeled) of roundwood and residue as pulpwood, Central States, 1966–1970*

Type of material and area	1966	1967	1968	1969	1970
Roundwood					
Illinois	84	63	68	50	62
Indiana, Iowa, Missouri	163	138	156	146	131
Total	247	201	224	196	193
Residue					
Illinois	25	50	92	135	100
Indiana, Iowa, Missouri	29	37	50	64	68
Total	54	87	142	199	168
All material	301	288	366	395	361

Table 5.—*Central States pulpwood production by State and destination, 1965–1970*
(Thousand cords)

Year	Illinois			Indiana			Iowa			Missouri		
	Total	Destination		Total	Destination		Total	Destination		Total	Destination	
		Central States	Other States		Central States	Other States		Central States	Other States		Central States	Other States
1965	92	89	2	86	81	5	31	31	*	22	20	2
1966	121	121	*	96	87	9	36	36	--	22	19	3
1967	96	96	*	84	77	7	35	35	*	37	37	--
1968	115	115	--	118	102	16	38	37	1	62	62	*
1969	132	128	4	132	107	25	31	30	1	81	71	10
1970	118	110	8	148	95	53	58	57	1	82	57	25

*Less than 500 cords.

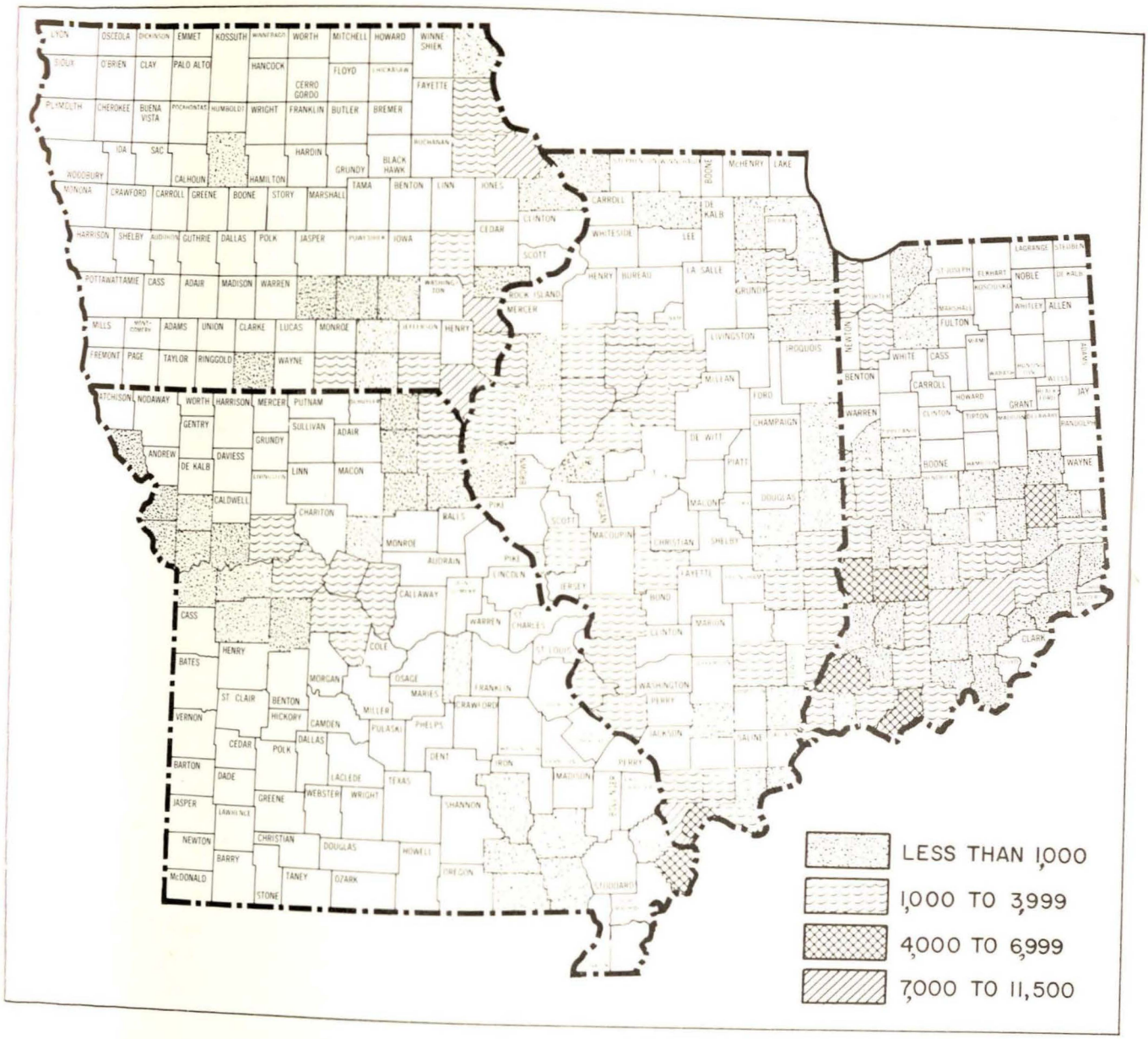


Figure 7.—Harvest of pulpwood bolts in the Central States, by counties, in standard cords, 1970.

Table 7.—*Active woodpulp mills in the Central States by location, type of pulp produced, and capacity, 1970*

Company	Location	Mill capacity in tons per 24 hours 1/				
		Total	Sulfite	Sulfate	Groundwood and other mechanical	Semi-chemical
Illinois:						
Philip Carey Corp.	Wilmington	30	--	--	30	--
Celotex Corp.	Peoria	190	--	--	190	--
Alton Box Board Co.	Alton	300	--	--	--	300
Bird & Son, Inc.	Chicago	40	--	--	40	--
Certain-Teed Products Corp.	East St. Louis	100	--	--	100	--
Flintkote Co., The	Mt. Carmel	40	--	--	40	--
Johns-Manville Products Corp.	Waukegan	65	--	--	65	--
GAF Corp.	Joliet	100	--	--	100	--
Total	8 plants	865	--	--	565	300
Indiana:						
Container Corp. of America 2/	Carthage	120	--	--	--	120
Weston Paper & Manufacturing Co.	Terre Haute	250	--	--	--	250
Total	2 plants	370	--	--	--	370
Iowa:						
Celotex Corp.	Dubuque	90	--	--	--	90
Consolidated Packaging Corp.	Fort Madison	135	--	--	--	135
United States Gypsum Co.	Fort Dodge	3/	--	--	--	--
Total	3 plants	225	--	--	--	225
Missouri:						
Huebert Fiberboard, Inc.	Booneville	60	--	--	60	--
GAF Corp.	Kansas City	110	--	--	110	--
Total	2 plants	170	--	--	170	--
All States	15 plants	1,630	--	--	735	895

1/ Lockwood's Directory of the Paper and Allied Industries-1970, and 1971 Directory of the Forest Products Industry.

2/ Pulpmill phased out in 1970.

3/ Capacity not available.

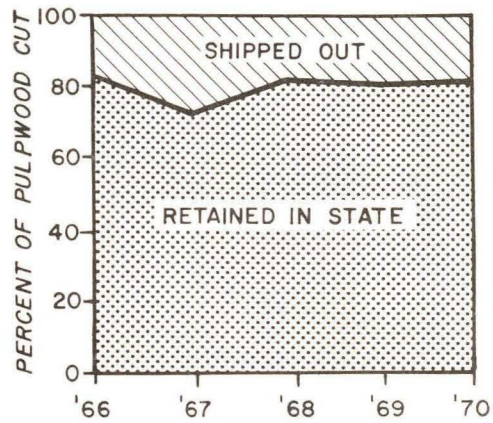
APPENDIX

Table 8.—*Lake States pulpwood production, by State of origin and destination, 1966–1970*

MINNESOTA

Year	Total cut	Destination of pulpwood			
		Minn.	Wis.	Mich.	Other
	(Thousand standard cords)				
1966	1,174	970	193	*	11
1967	1,205	884	299	*	22
1968	1,087	900	166	*	21
1969	1,192	977	188	--	27
1970	1,224	981	219	*	24
5-year average	1,176	942	213	*	21

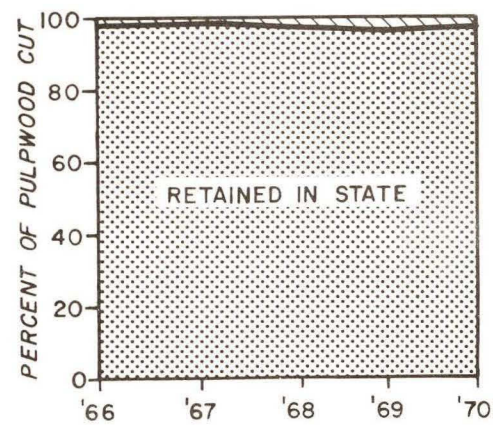
*Less than 500 cords.



WISCONSIN

Year	Total cut	Destination of pulpwood			
		Minn.	Wis.	Mich.	Other
	(Thousand standard cords)				
1966	1,536	13	1,501	3	19
1967	1,416	15	1,387	*	14
1968	1,297	22	1,259	4	12
1969	1,450	17	1,412	9	12
1970	1,656	11	1,627	10	8
5-year average	1,471	16	1,437	5	13

*Less than 500 cords.



MICHIGAN

Year	Total cut	Destination of pulpwood			
		Minn.	Wis.	Mich.	Other
	(Thousand standard cords)				
1966	1,570	1	666	901	2
1967	1,344	--	660	684	*
1968	1,168	--	455	702	11
1969	1,302	--	537	752	13
1970	1,406	--	610	785	11
5-year average	1,358	*	586	764	8

*Less than 500 cords.

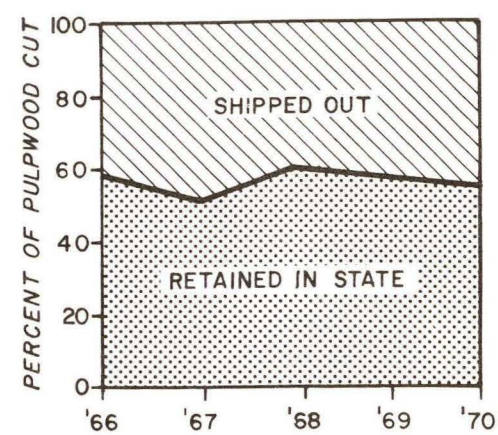


Table 9.—*Lake States pulpwood receipts by State and species, 1970*

(Thousand standard cords, roughwood basis)

Species	Minnesota	Wisconsin	Michigan	Total receipts
Aspen	557	1,088	332	1,977
Balsam fir	42	112	26	180
Birch	31	80	28	139
Hemlock	--	118	3	121
Pine	188	498	152	838
Spruce	111	208	22	341
Tamarack	--	43	--	43
Misc. hardwoods	33	333	154	520
All roundwood	962	2,480	717	4,159
Residue, softwood	22	189	11	221
Residue, hardwood	74	152	77	304
All wood material	1,058	2,821	805	4,684

Table 10.—*Lake States pulpwood production, by Forest Survey Unit and destination by State, 1970*

(Thousand standard cords, roughwood basis)

MINNESOTA

Unit	Total cut	Destination of pulpwood: Minnesota	Wisconsin	Michigan	Other
Northeastern	452	336	112	*	4
Central Pine	436	346	90	*	--
Rainy River	268	237	11	--	20
Hardwood & Prairie	68	62	6	--	--
Total	1,224	981	219	*	24

WISCONSIN

Unit	Total cut	Destination of pulpwood: Minnesota	Wisconsin	Michigan	Other
Northeastern	774	--	763	10	1
Northwestern	581	3	578	--	--
Central	255	2	253	--	*
Southeastern & Southwestern	46	6	33	--	7
Total	1,656	11	1,627	10	8

MICHIGAN

Unit	Total cut	Destination of pulpwood: Minnesota	Wisconsin	Michigan	Other
E. 1/2 Up. Pen.	329	--	247	72	10
W. 1/2 Up. Pen.	407	--	363	44	--
N. 1/2 Low. Pen.	615	--	--	614	1
S. 1/2 Low. Pen.	55	--	--	55	--
Total	1,406	--	610	785	11

*Less than 500 cords.

Table 11.—*Lake States pulpwood production by species, State, and Survey Unit, 1966–1970*

(Thousand standard cords, roughwood basis)

Unit	ASPEN					BALSAM FIR				
	Annual production					Annual production				
	1966	1967	1968	1969	1970	1966	1967	1968	1969	1970
MINNESOTA										
Northeastern	205	205	203	204	208	20	26	12	10	9
Central Pine	272	265	218	289	249	35	30	18	18	22
Rainy River	123	108	131	148	127	25	20	13	12	14
Prairie & Hardwood	12	13	31	19	16	--	--	*	--	*
Total	612	591	583	660	600	80	76	43	40	45
WISCONSIN										
Northeastern	449	430	369	416	430	28	26	25	28	40
Northwestern	298	273	202	244	296	26	21	22	22	29
Central	61	35	55	35	44	1	*	4	*	*
Southeastern & Southwestern	2	1	3	2	1	--	*	--	--	--
Total	810	739	629	697	771	55	47	51	50	69
MICHIGAN										
E. 1/2 Up. Pen.	156	144	95	119	124	48	50	39	27	41
W. 1/2 Up. Pen.	222	237	167	184	180	37	38	22	16	25
N. 1/2 Low. Pen.	388	258	274	296	288	3	3	1	1	*
S. 1/2 Low. Pen.	10	7	5	7	4	--	--	--	--	--
Total	776	646	541	606	596	88	91	62	44	66
LAKE STATES	2,198	1,976	1,753	1,963	1,967	223	214	156	134	180

*Less than 500 cords.

(Continued on next page)

(Table 11 continued)

MINNESOTA

Unit	BIRCH					HEMLOCK				
	Annual production					Annual production				
	1966	1967	1968	1969	1970	1966	1967	1968	1969	1970
Northeastern	--	1	*	3	17	--	--	--	--	--
Central Pine	1	2	1	*	12	--	--	--	--	--
Rainy River	--	--	--	--	2	--	--	--	--	--
Prairie & Hardwood	--	--	--	--	*	--	--	--	--	--
Total	1	3	1	3	31	--	--	--	--	--
WISCONSIN										
Northeastern	9	28	18	23	32	48	27	22	32	33
Northwestern	26	46	35	37	42	18	13	18	16	16
Central	4	10	3	3	2	3	2	4	3	3
Southeastern & Southwestern	--	*	*	--	--	--	--	*	--	--
Total	39	84	56	63	76	69	42	44	51	52
MICHIGAN										
E. 1/2 Up. Pen	3	3	2	1	4	21	16	9	11	17
W. 1/2 Up. Pen.	2	2	*	1	2	78	44	36	52	52
N. 1/2 Low. Pen.	8	6	11	21	27	--	--	--	*	*
S. 1/2 Low. Pen.	--	--	--	*	--	--	--	--	--	--
Total	13	11	13	23	33	99	60	45	63	69
LAKE STATES	53	55	70	89	140	168	102	89	114	121

*Less than 500 cords.

(Continued on next page)

(Table 11 continued)

MINNESOTA

Unit	JACK PINE[1/] Annual production					SPRUCE Annual production				
	1966	1967	1968	1969	1970	1966	1967	1968	1969	1970
Northeastern	138	108	121	133	123	78	93	66	66	64
Central Pine	85	69	62	74	68	31	45	31	27	31
Rainy River	15	11	12	18	19	61	79	60	60	85
Prairie & Hardwood	18	14	8	12	11	2	1	*	1	1
Total	256	202	203	237	221	172	218	157	154	181
WISCONSIN										
Northeastern	58	45	46	63	72	14	10	7	10	12
Northwestern	92	61	57	77	96	4	3	3	3	4
Central	64	67	94	75	87	*	*	1	*	*
Southeastern & Southwestern	1	1	2	1	4	--	--	--	--	--
Total	215	174	199	216	259	18	13	11	13	16
MICHIGAN										
E. 1/2 Up. Pen.	63	40	39	59	57	31	33	23	20	29
W. 1/2 Up. Pen.	47	36	33	38	34	42	40	16	18	22
N. 1/2 Low. Pen.	138	115	131	109	145	1	2	*	1	*
S. 1/2 Low. Pen.	2	2	2	1	4	--	--	--	--	--
Total	250	193	205	207	240	74	75	39	39	51
LAKE STATES	721	569	607	660	720	264	306	207	206	248

*Less than 500 cords.

1/ Includes small quantity of red and white pine.

(Continued on next page)

(Table 11 continued)

MINNESOTA

Unit	TAMARACK					MISC. HARDWOODS				
	Annual production					Annual production				
	1966	1967	1968	1969	1970	1966	1967	1968	1969	1970
Northeastern	1	6	4	4	5	4	9	7	11	14
Central Pine	6	27	16	14	23	13	6	5	11	3
Rainy River	*	4	4	2	7	13	23	9	8	9
Prairie & Hardwood	*	3	1	1	1	1	1	2	2	1
Total	7	40	25	21	36	31	39	23	32	27
WISCONSIN										
Northeastern	1	2	3	1	2	80	64	60	87	110
Northwestern	2	1	2	1	2	70	62	50	61	79
Central	*	--	*	*	*	84	71	68	81	99
Southeastern & Southwestern	--	--	--	--	--	8	6	7	9	8
Total	3	3	5	2	4	242	203	185	238	296
MICHIGAN										
E. 1/2 Up. Pen.	1	1	1	1	2	16	6	3	10	18
W. 1/2 Up. Pen.	*	*	1	1	1	70	79	48	38	28
N. 1/2 Low. Pen.	--	--	--	--	--	103	112	116	141	143
S. 1/2 Low. Pen.	--	--	--	--	--	5	2	4	7	7
Total	1	1	2	2	3	194	199	171	196	196
LAKE STATES	11	44	32	25	43	467	484	379	466	519

*Less than 500 cords.

(Continued on next page)

(Table 11 continued)

MINNESOTA

Unit	RESIDUE					ALL SPECIES[1/]				
	Annual production					Annual production				
	1966	1967	1968	1969	1970	1966	1967	1968	1969	1970
Northeastern	3	11	8	6	12	449	459	421	437	452
Central Pine	6	9	12	4	28	449	453	363	437	436
Rainy River	--	4	11	5	5	237	249	240	253	268
Prairie & Hardwood	6	12	21	30	38	39	44	63	65	68
Total	15	36	52	45	83	1,174	1,205	1,087	1,192	1,224
WISCONSIN										
Northeastern	49	41	53	49	43	736	673	603	709	774
Northwestern	7	22	21	17	17	543	502	410	478	581
Central	5	22	16	16	20	222	207	245	213	255
Southeastern & Southwestern	24	26	27	38	33	35	34	39	50	46
Total	85	111	117	120	113	1,536	1,416	1,297	1,450	1,656
MICHIGAN										
E. 1/2 Up. Pen.	11	2	2	29	37	350	295	213	277	329
W. 1/2 Up. Pen.	23	32	34	54	63	521	508	357	402	407
N. 1/2 Low. Pen.	3	11	16	6	12	644	507	549	575	615
S. 1/2 Low. Pen.	38	23	38	33	40	55	34	49	48	55
Total	75	68	90	122	152	1,570	1,344	1,168	1,302	1,406
LAKE STATES	175	215	259	287	348	4,280	3,965	3,552	3,944	4,286

1/ Including residues.

Table 12.—*Lake States pulpwood production by county and species, 1970*

(Thousand standard cords, roughwood basis)

WISCONSIN

Unit and county[1/]	All species	Aspen	Balsam	Birch	Hemlock	Pine	Spruce	Tamarack	Misc. hdwds.	Residues[2/]
NORTHEASTERN:										
Florence	42	29	5	*	3	1	2	--	2	
Forest	95	60	6	2	7	4	1	*	15	
Langlade	95	66	2	5	1	4	*	*	17	
Lincoln	103	66	2	5	1	3	1	*	25	
Marinette	116	77	10	3	2	13	3	*	8	
Oconto	29	23	1	*	*	3	*	--	2	
Oneida	141	62	8	9	4	27	4	2	25	
Shawano[3/]	30	15	*	*	10	1	*	*	4	
Vilas	80	32	6	8	5	16	1	--	12	
Total	774	430	40	32	33	72	12	2	110	43
NORTHWESTERN:										
Ashland	52	24	9	3	4	4	1	*	7	
Barron	2	*	--	*	--	*	--	--	2	
Bayfield	85	51	1	7	1	22	*	*	3	
Burnett	16	2	--	--	--	13	--	1	*	
Douglas	84	52	1	2	--	28	1	*	*	
Iron	57	42	3	3	3	*	*	*	6	
Polk	3	1	--	--	--	2	--	--	--	
Price	102	52	9	13	2	3	1	*	22	
Rusk	16	10	*	2	*	*	*	*	4	
Sawyer	47	18	5	8	2	4	1	*	9	
Taylor	59	27	1	3	4	1	*	*	23	
Washburn	41	17	*	1	*	19	*	1	3	
Total	581	296	29	42	16	96	4	2	79	17
CENTRAL:										
Adams	37	2	--	--	--	18	--	--	17	
Chippewa	8	6	*	1	*	1	*	--	*	
Clark	23	8	*	*	*	3	--	--	12	
Eau Claire	8	1	--	*	--	7	--	*	*	
Jackson	17	1	--	*	--	15	--	--	1	
Juneau	30	2	--	*	--	19	--	--	9	
Marathon	45	16	*	1	3	2	*	*	23	
Marquette	9	--	--	--	--	1	--	--	8	
Monroe	4	*	--	--	--	3	--	--	1	
Portage	16	3	*	*	*	5	*	*	8	
Waupaca	5	3	*	*	*	*	*	*	2	
Waushara	10	*	--	--	--	6	*	*	4	
Wood	23	2	--	*	*	7	--	--	14	
Total	255	44	*	2	3	87	*	*	99	20

(Continued on next page)

(Table 12 continued)

WISCONSIN (continued)

Unit and county[1]	All species	Aspen	Balsam	Birch	Hemlock	Pine	Spruce	Tamarack	Misc. hdwds.	Residues[2]
SOUTHWESTERN:										
Buffalo	*	--	--	--	--	*	--	--	--	
Dunn	*	--	--	--	--	*	--	--	--	
Grant	4	--	--	--	--	--	--	--	4	
Iowa	*	--	--	--	--	--	--	--	*	
La Cresse	1	--	--	--	--	1	--	--	--	
Pepin	1	--	--	--	--	1	--	--	--	
Richland	*	--	--	--	--	*	--	--	--	
Sauk	*	--	--	--	--	*	--	--	--	
Trempealeau	*	*	--	--	--	--	--	--	--	
Total	30	*	--	--	--	2	--	--	4	24
SOUTHEASTERN:										
Columbia	4	--	--	--	--	2	--	--	2	
Dodge	*	--	--	--	--	--	--	--	*	
Fond du Lac	*	--	--	--	--	*	--	--	*	
Green Lake	*	--	--	--	--	*	--	--	--	
Jefferson	*	--	--	--	--	--	--	--	*	
Manitowoc	*	--	--	--	--	--	--	--	*	
Outagamie	1	1	--	--	--	*	--	--	*	
Sheboygan	2	--	--	--	--	--	--	--	2	
Washington	*	--	--	--	--	--	--	--	*	
Total	16	1	--	--	--	2	--	--	4	9
State total	1,656	771	69	76	52	259	16	4	296	113

1/ Includes only those counties that supplied pulpwood in 1970.
2/ County figures are not available.
3/ Includes Menominee County.
* Less than 500 cords.

(Continued on next page)

Table 12 continued)

MICHIGAN

Unit and county 1/	All species	Aspen	Balsam	Birch	Hemlock	Pine	Spruce	Tamarack	Misc. hdwds.	Residues 2/
E. 1/2 UP. PEN.:										
Alger	13	2	1	--	1	6	1	--	2	
Chippewa	29	6	2	*	2	12	4	1	2	
Delta	79	31	18	1	4	10	11	*	4	
Luce	27	2	1	*	3	17	2	*	2	
Mackinac	15	4	1	1	*	3	1	--	5	
Menominee	95	69	13	1	2	*	8	1	1	
Schoolcraft	34	10	5	1	5	9	2	*	2	
Total	329	124	41	4	17	57	29	2	18	37
W. 1/2 UP. PEN.:										
Baraga	54	24	1	1	16	6	2	--	4	
Dickinson	61	43	6	*	2	2	6	1	1	
Gogebic	34	14	1	1	10	1	*	--	7	
Houghton	31	16	1	*	10	1	1	--	2	
Iron	77	50	5	*	4	2	3	*	13	
Keweenaw	5	*	3	--	--	--	2	*	--	
Marquette	60	18	7	*	5	22	8	*	*	
Ontonagon	22	15	1	*	5	*	*	--	1	
Total	407	180	25	2	52	34	22	1	28	63
N. 1/2 LOW. PEN.:										
Alcona	47	31	*	3	--	1	*	--	12	
Alpena	15	9	*	2	--	1	*	--	3	
Antrim	1	1	--	*	--	--	--	--	*	
Arenac	1	1	--	*	--	--	--	--	*	
Benzie	7	4	--	*	--	--	--	--	3	
Cheboygan	14	8	*	2	--	3	*	--	1	
Clare	26	14	--	3	--	3	--	--	6	
Crawford	31	5	*	*	*	20	*	--	6	
Emmet	*	--	--	--	--	--	--	--	*	
Gladwin	7	2	--	1	--	2	--	--	2	
Grand Traverse	18	11	--	*	--	2	--	--	5	
Iosco	23	2	--	*	--	19	--	--	2	
Isabella	4	3	--	--	--	*	--	--	1	
Kalkaska	13	6	*	1	*	5	*	--	1	
Lake	49	13	--	1	*	11	--	--	24	
Leelanau	3	3	--	*	--	*	--	--	*	
Manistee	31	11	--	*	*	1	--	--	19	
Mason	21	7	--	*	--	4	--	--	10	
Mecosta	25	23	--	*	--	1	--	--	1	
Midland	7	7	--	*	--	--	--	--	*	
Missaukee	10	7	--	*	--	1	--	--	2	
Montmorency	31	17	*	2	--	7	*	--	5	
Newaygo	24	10	--	*	--	5	--	--	9	
Oceana	7	2	--	*	--	2	--	--	3	
Ogemaw	18	9	*	1	--	5	*	--	3	
Osceola	23	16	--	1	--	1	--	--	5	
Oscoda	59	20	*	3	--	32	*	--	4	
Otsego	3	*	*	*	--	2	*	--	1	
Presque Isle	21	12	*	4	--	3	*	--	2	
Roscommon	30	18	*	2	*	2	*	--	8	
Wexford	34	16	--	1	*	12	--	--	5	
Total	615	288	*	27	*	145	*	--	143	12

(Continued on next page)

(Table 12 continued)

MICHIGAN (continued)

Unit and county[1]	All species	Aspen	Balsam	Birch	Hem-lock	Pine	Spruce	Tam-arack	Misc. hdwds.	Residues[2]
S. 1/2 LOW. PEN.:										
Allegan	*	*	--	--	--	*	--	--	*	
Barry	*	--	--	--	--	--	--	--	*	
Cass	1	--	--	--	--	1	--	--	--	
Gratiot	1	1	--	--	--	--	--	--	*	
Ionia	*	*	--	--	--	--	--	--	--	
Kent	*	*	--	--	--	*	--	--	*	
Lenawee	*	--	--	--	--	--	--	--	*	
Montcalm	9	3	--	--	--	*	--	--	6	
Muskegon	3	*	--	--	--	3	--	--	*	
Ottawa	*	*	--	--	--	*	--	--	*	
St. Joseph	*	*	--	--	--	--	--	--	*	
Van Buren	1	--	--	--	--	--	--	--	1	
Total	55	4	--	--	--	4	--	--	7	40
State total	1,406	596	66	33	69	240	51	3	196	152

1/ Includes only those counties that supplied pulpwood in 1970.
2/ County figures are not available.
* Less than 500 cords.

(Continued on next page)

(Table 12 continued)

MINNESOTA

Unit and county[1]	All species	Aspen	Balsam	Birch	Pine	Spruce	Tamarack	Misc. hdwds.	Residues[2]
NORTHEASTERN:									
Carlton	26	22	1	1	1	1	*	--	
Cook	37	1	1	--	7	28	--	--	
Lake	66	22	*	1	30	13	*	--	
Pine	12	7	*	1	1	*	--	3	
St. Louis	299	156	7	14	84	22	5	11	
Total	452	208	9	17	123	64	5	14	12
CENTRAL PINE:									
Aitkin	49	34	3	2	1	2	6	1	
Becker	3	2	*	*	*	*	1	--	
Beltrami	77	46	8	1	12	6	3	1	
Cass	44	28	1	2	10	1	1	1	
Clearwater	50	39	*	*	5	2	4	*	
Crow Wing	11	3	--	1	7	--	--	--	
Hubbard	33	19	*	1	11	1	1	*	
Itasca	130	74	10	4	16	19	7	*	
Wadena	11	4	--	1	6	--	--	--	
Total	436	249	22	12	68	31	23	3	28
RAINY RIVER:									
Koochiching	227	125	14	2	14	58	5	9	
Lake of the Woods	36	2	*	*	5	27	2	--	
Total	268	127	14	2	19	85	7	9	5
HARDWOOD:									
Mille Lacs	6	5	*	--	--	*	--	1	
Morrison	7	6	*	--	1	*	--	--	
Ottertail	--	--	--	--	--	--	--	--	
Rice	*	--	--	--	*	--	--	--	
Scott	*	--	*	--	--	--	--	--	
Todd	*	--	--	--	*	--	--	--	
Total	51	11	*	--	1	*	--	1	38
PRAIRIE:									
Mahnomen	3	3	--	--	--	--	*	--	
Pennington	--	--	--	--	--	--	--	--	
Polk	1	--	--	--	--	--	1	--	
Roseau	13	2	--	*	10	1	*	--	
Total	17	5	--	*	10	1	1	--	--
State total	1,224	600	45	31	221	181	36	27	83

1/ Includes only those counties that supplied pulpwood in 1970.
2/ County figures are not available.
* Less than 500 cords.

☆ U.S. Government Printing Office 1971-760-333

RECENT REPORTS ON PULPWOOD PRODUCTION PUBLISHED BY THE NORTH CENTRAL FOREST EXPERIMENT STATION

Pulpwood production in Lake States Counties, by Arthur G. Horn:

1960 data: Station Paper 94, 28 p.
1961 data: Station Paper 106, 18 p.
1962 data: Research Paper LS-5, 16 p.
1963 data: Resource Bulletin LS-1, 17 p.
1964 data: Resource Bulletin LS-2, 19 p.

Pulpwood Production in the North Central Region by County, by James E. Blyth:

1965 data: Resource Bulletin NC-2, 24 p.
1966 data: Resource Bulletin NC-3, 27 p.
1967 data: Resource Bulletin NC-6, 23 p.
1968 data: Resource Bulletin NC-8, 22 p.
1969 data: Resource Bulletin NC-11, 23 p.

Brief Notes for the past 10 years are:

1960: Tech. Note 606
1961: Tech. Note 624
1962: Research Note LS-23
1963: Research Note LS-48
1964: Research Note LS-65
1965: Research Note NC-3
1966: Research Note NC-31
1967: Research Note NC-59
1968: Research Note NC-86
1969: Research Note NC-100
1970: Research Note NC-126

ABOUT THE FOREST SERVICE . . .

As our Nation grows, people expect and need more from their forests — more wood; more water, fish, and wildlife; more recreation and natural beauty; more special forest products and forage. The Forest Service of the U.S. Department of Agriculture helps to fulfill these expectations and needs through three major activities:

- Conducting forest and range research at over 75 locations ranging from Puerto Rico to Alaska to Hawaii.
- Participating with all State forestry agencies in cooperative programs to protect, improve, and wisely use our Country's 395 million acres of State, local, and private forest lands.
- Managing and protecting the 187-million acre National Forest System.

The Forest Service does this by encouraging use of the new knowledge that research scientists develop; by setting an example in managing, under sustained yield, the National Forests and Grasslands for multiple use purposes; and by cooperating with all States and with private citizens in their efforts to achieve better management, protection, and use of forest resources.

Traditionally, Forest Service people have been active members of the communities and towns in which they live and work. They strive to secure for all, continuous benefits from the Country's forest resources.

For more than 60 years, the Forest Service has been serving the Nation as a leading natural resource conservation agency.